The Global Crisis and its impact on the index performance of B&MFBOVESPA

Márcio Nakayama Miura
Professor at Center of Social Science Applied and Evaluator of MEC/INEP
State University of Paraná West, Brazil (Universidade Estadual do Oeste do Paraná)
E-mail: adm.miura@gmail.com
Address: Rua Universitária, 1619, Universitário, 85819-110 – Cascavel/PR, Brazil.

Deosir Flávio Lobo de Castro Júnior
Adjunct Professor of Department of Social Science Applied
Federal Institute Catarinense, Brazil (Instituto Federal Catarinense)
E-mail: deosir@ifisc.edu.br
Address: Rua 14 de Julho, 150, Coqueiros, 88075-010 – Florianópolis/SC, Brazil.

Elvis Silveira Martins
Adjunct Professor at Business Administration and Tourism College
State University of Pelotas, Brazil (Universidade Federal de Pelotas)
E-mail: elvis.professor@gmail.com
Address: Rua Gomes Carneiro, 1, Centro, 96010-610 – Pelotas/RS, Brazil.

Nilton César Lima
Adjunct Professor at Accounting College
Federal University of Uberlândia, Brazil (Universidade Federal de Uberlândia)
E-mail: cesarlim@yahoo.com
Address: Av. João Naves de Ávila, 2121, Bloco F., St. Mônica, 38408-144 – Uberlândia/MG, Brazil.

Gustavo Henrique Silva de Souza
Master Student in Social Psychology at Laboratory of Evaluation and Cognitive and Emotional Measure
Federal University of Alagoas, Brazil (Universidade Federal de Alagoas)
E-mail: souza.g.h.s@hotmail.com.br
Address: Trav. José Laranjeiras, 74, Jacintinho, 57040-655 – Maceió/AL, Brazil.

ABSTRACT

The objective of this following article was to comparatively analyze the profitability of IBOVESPA, ICG, and ISE, from January 2008 to December 2011, a period which was considered of great changes regarding the global economy. The research is characterized as descriptive having a quantitative approach. For so, not only descriptive statistics was used, but also graphic comparison of the profitability indexes, Spearman correlation analysis among the variables, and also the variation analysis among the profitability of the indexes. The results show that in 2008, IBOVESPA and IGC had a strong negative correlation which might lead to a migration of investors to papers which were considered more reliable at the beginning of the crisis. Nevertheless, during the following years the three indexes had a strong correlation showing that in moments of crisis, and the time of this phenomenon, seem to affect all indexes that behave in a similar way.

Keywords: *Global financial and economic crisis; Sustainability; Social responsibility; Stocks; Performance.*

1. INTRODUCTION

Recently, the event that marked this last decade, made news and had its reflection in all economies, was the global financial economic crisis of 2008 and who still has reflexes in entrepreneurship and in the economy of many countries including Brazil (Cintra and Farhi, 2008; IBGE, 2008; Mendes, 2009). Despite the reflexes in Brazil have not been so intense as in other countries that doesn't mean immunity to the crisis. We could say that the so-called crisis of 2008 "ended" in 2010 from a new crisis of Greece which influence the entire world economy and that continued with full force in 2011 (Miura, Souza and Marcon, 2011) Corporate Social responsibility has been increasingly debated between the academic sphere, business and society as a whole, giving rise to several questions still without clear answers, as the very definition of dimension of corporate social responsibility in the business scenario (Borba, 2006).

Machado, Machado and Corrar (2009) observed that in 1999, was created, in the United States, the *Dow Jones Sustainability Index,* first index to evaluate the financial performance of the leading sustainability companies. In Brazil, the first investment fund consisting of companies recognized for developing good practices of social, environmental and corporate responsibility was the Ethical Fund, created in 2001 by the Bank ABN AMRO.

Since 1968 the *Bovespa Index* - IBOVESPA is the Brazilian indicator which represents, as well as in other world stock markets, the average performance of major stock market quotations and negotiations the vista profile observed in the trading. In the year 2001, Bovespa has created the special corporate governance stock index (IGC), a segment composed of shares of companies that apply in their managements corporate governance principles. In 2005, the Bovespa has launched the corporate sustainability index (ISE), composite indicator of shares issued by companies that have a high degree of commitment to sustainability and social responsibility (Cavalcante, Misumi and Rudge, 2009; Miura, Souza and Marcon, 2011).

Given the above, the overall objective of the present research is to do a comparative analysis between the average profitability of indices (IBOVESPA, IGC and ISE) from January 2008 to December 2011 period of great global turbulence.

In order to facilitate the achievement of the overall objective are defined the following specific objectives:

- Descriptive statistics and graphical comparison of yields;
- Spearman's rank correlation analysis between the variables;
- Analysis of the variability between the profitability of the corporate sustainability index (ISE), IGC-special corporate governance stock index and Bovespa index (IBOVESPA).

2. THEORETICAL FOUNDATION

2.1. *The Global Economic-Financial Crisis*

The integration of markets is every day more present reality in all the world's economies. The theory of chaos, was the action of a stereotypical beat of a butterfly's wings in Oceania being able to cause storms in the northern hemisphere, strongly resembles with the global financial crisis lived from the second half of 2007 in the U.S. and that quickly influenced the world markets resulting in a real mess. The development of chaos theory, to Ferreira and da Silva (2010) presents itself for the reasons of dynamical systems and sensitive to initial conditions, which occurred in the world economy.

To Moshirian (2011), the sharp drop in the value of assets, real estate, commodity prices, the collapse of a number of large banks and non-banks and an increase in unemployment, has led the IMF to refer to the recent global recession, as "the great recession". In other words, the global financial crisis intensified, along with financial institutions in various parts of the world. Due to this fact, the prospects of the world economy deteriorated. To the author, some Governments have offered guarantees to its depositors and creditors as a way to contain a systemic crisis, and even becoming owners of some banks and key companies to the economy. However, the effect was that the global financial crisis has reduced the activities of the international trade, introduced the financial protectionism, there were financial regulations that misread autonomy of the Central Bank.

In the conception of Shahrokhi (2011), the financial crisis of this first decade of the 3rd millennium, spread quickly due to modern communications and global integration of financial markets. Although, the Governments intervene, the author points out that there was no coordination of actions with a unified plan. This created uncertainty and was part of the cause of an economic downturn, especially in the freezing in the derivatives market. Despite the financial sector initially be the most sensitive to the crisis, triggering the other sectors was inevitable, because the author's financial system lubricates the engine of production and trade. The events that followed resulted in the global financial crisis and global recession. An important consequence of the events is the decrease of the dominant role of the United States into the world economy. Thus, the financial crisis has been understood as morals. Arising from problems in the U.S. housing market finally shake the morale of major North American financial groups and in various countries, mainly in Europe.

On the other hand, other authors maintain that one of the cocktail of factors that prompted the crisis prevail three. As set out by Iley and Lewis (2011), which argue that the main reasons were: permissive lending, weaknesses in credit transfer processes, and overly optimistic ratings of structured securities such as mortgage-backed securities and collateralized debt obligations.

Lordon (2007) to analyze the reasons for the crisis, especially the U.S. financial system by not learn (or don't want to) with the earlier crisis and CITES some of the latest: 1987, breakage of stock markets; 1990, of “junk bonds” and crisis “savings and loans” US; 1994, breakage of holders of debentures Americans; 1997, the first phase of the international financial crisis (Thailand, Korea, Hong Kong); 1998, second phase (Russia, Brazil); 2001-2003, the Internet bubble burst. Forrester (2010) reports that there are no crises and Yes mutations of the crisis.

In fact, the market is blind sometimes amid the possibility of greater profitability and sometimes act without discretion, as if everything were always go right. The initial idea was to extend the maximum property sales, real estate commissions, capital gains with the valuation of buildings and etc. Everything worked while the owners were able to pay their mortgages, but all it took was the delinquencies climb to that took place a strong contraction in consumer credit and in this way the market disappeared (no purchases, no sales, no commissions etc.). In this context, in August 2007, the market for high-risk subprime collapsed hitting the financial and capital market of the UNITED STATES and European countries, whose financial agents, had direct relationship with the securitization or North American mortgage securitization.

Krugman *apud* Holland and Brito (2010) comment that “if there are errors in monetary and fiscal policy that caused the last crisis in 2007/2008, they are due much more to omissions and difficulties of associating the excess liquidity with monetary strategies”. The omission on the part of the Federal Reserve-FED is related to the lack of control or even monitor the overvaluation of real estate in the U.S., closing his eyes to the growing credit for so-called release: no income, no job, no ballast and that resulted in the crisis experienced by the global financial system.

Holland and Brito (2010, p. 181) to analyze the aspects impacting on 2007/2008 crisis claim that it is a result of several factors combined and mentioning some as: “economic policy errors, errors, errors of financial market economic agents who lived on foibles of mortgage-backed securities, i.e. debt-backed securities, naively confident econometric techniques and methods attuned to measure volatility and exposure to risks”.

Mendonça *et al.* (2008) Similarly examine the extent of this crisis, linked to the falling prices of assets (real estate), the inability to honor the payments and the political decision of the US Government not to intervene with public financing to fund its main banks, is still a doubt for the scholars, to the extent that the world financial system is in constant motion. The perception of greater or lesser crisis on the part of several countries is related to the degree of dependence and connection with subprime securities and guarantees of North American mortgage securities.

2.2. *BM&FBOVESPA and Bovespa's index – IBOVESPA*

The BM&FBOVESPA is a Brazilian company, formed in 2008 from the integration of the operations of the São Paulo Stock Exchange and the commodities
As well as the other bags in the world, the BM&FBOVESPA has an indicator capable of measuring the average price performance of a theoretical portfolio of shares, measuring market behavior in a given period of time. The absolute value of portfolio index expresses the value of the portfolio of stocks traded on the stock exchange, and the variations observed in a period for the other understood as their profitability.

The Bovespa's Index - IBOVESPA it was created in January 2, 1968 and is the Brazilian indicator represents accurately the average performance of major stock market quotations and negotiations the vista profile observed in the trading. The IBOVESPA is considered of greater relevance since it never suffered variation in its calculation methodology, as well as maintained the integrity of their historical series.

The IBOVESPA's theoretical portfolio is composed by actions that have cumulatively the following criteria, in relation to the 12 months prior to the formation of the portfolio:

- Be included in a group of stocks whose negotiability indexes added represent 80% of the total value of all individual indexes;
- Present participation in terms of volume, in excess of 0.1% of the total;
- Have been negotiated in more than 80% of the trading sessions.

2.3. *New Market, IGC and the ISE*

Deployed in December 2000 by the former São Paulo Stock Exchange (Bovespa), New market and Differentiated corporate governance levels - Level 1 and level 2 - are special listing segments developed with the aim of providing an environment that stimulates trade, at the same time, the interest of investors and the valuation of companies.

Although they have similar foundations, the new market is directed mainly to the list of companies that will open capital, while Different levels 1 and 2 are intended for companies which already have shares traded in the current BM&FBOVESPA.

The IGC - Special corporate governance stock index was created in 2001 and aims to measure the performance of a theoretical portfolio composed of shares of companies that have high levels of corporate governance. Such companies should be traded on the Novo Mercado or be classified in levels 1 or 2 of BM&FBOVESPA.

Elect to include in the index theoretical portfolio all shares issued by companies traded on the Novo Mercado or classified in levels 1 and 2 of BM&FBOVESPA.

Are included in the index portfolio all companies admitted to trading on the Novo Mercado and tiers 1 and 2 of BM&FBOVESPA. The procedures for the inclusion of an action in the index with the following rule:

Actions of new companies:

- Will be included after the close of the first regular trading session negotiation.

Shares of companies already traded on the BM&FBOVESPA:

- Will be included after the closing of trading prior to the start of trading on the Novo Mercado or level 1 or 2.

Once the company has adhered to Levels 1 or 2 of BM&FBOVESPA, all kinds of shares issue will take part in the index portfolio, except if its liquidity is considered too narrow. The direct business are not considered for the purposes of the calculation of the liquidity.

After the creation and consolidation of new market and the special corporate governance stock index (IGC), the BM&FBOVESPA launched in December 2005 the Business sustainability index (ISE). The ISE aims to reflect the return of a portfolio composed of shares of companies with recognized commitment to social responsibility and corporate sustainability, and also act as promoter of best practices in business environment. The Working Group to create the ISE was made up of representatives of institutions involved in issues related to social responsibility, corporate governance, environment and capital markets. The Group has defined the basic guidelines for the development of the content and the design of a technical and financial proposal to be submitted to the International Finance Corporation (IFC), the private arm of the World Bank and funder of research on methodology for the index.

In the same way as was done in other countries, the BM&FBOVESPA sought support from specialized entities in the subject to make the composition of your content. With funding from the IFC, the Center for sustainability studies (GVces), *Escola de Administração de Empresas de São Paulo da Fundação Getulio Vargas* (EAESP/FGV) developed the methodology and went on to represent role similar to that played by sought support from specialized entities in the subject to make the composition of your content. With funding from the IFC, the Center for sustainability studies (GVces), *Escola de Administração de Empresas de São Paulo da Fundação Getulio Vargas* (EAESP/FGV) developed the methodology and went on to represent role similar to that played by the Sustainable Asset Management (SAM) for the Dow Jones or the Ethical Investment Research Service (Eiris) to the London Stock Exchange. Currently the Board of ISE, was composed by the following institutions: Brazilian Association of closed private pension entities (ABRAAP); Brazilian Association of entities of financial and Capital Markets (ANBIMA); Association of investment analysts and professionals (APIMEC) market; Securities, commodities and Futures Exchange (BMF&BOVESPA); Brazil's corporate governance Institute (IBGC); Ethos Institute of companies and Social responsibility; International Finance Corporation (IFC); Ministry of the environment; and the United Nations Environment Program (PNUMA).

The corporate sustainability Index was formalized in July 21, 2005, when the revised questionnaire, which assesses the sustainability of candidate companies to participate in the ISE, was submitted to public consultation. In its final version, forwarded to the issuing companies of the 150 most liquid shares of BMF&BOVESPA, brought 136 objective issues distributed in the following dimensions: General; nature of the product or service; corporate governance; financial-economic; the environment; environment for financial institutions; and social. Between these indicators and general nature of the product include, for example, if the company publishes Social responsibility or sustainability reports and endorsed the UN global compact.

The maximum number of participants/ISE Bovespa is of 40 companies. For companies participating in the composition of the index is necessary to answer a questionnaire, with the dimensions, criteria and indicators. The responses are analyzed by statistical cluster analysis tool, which identifies groups of enterprises with similar performances and points the group with better overall performance. The companies of this group will compose the ISE portfolio after approval by the Board.

Integrate the ISE portfolio the stocks that meet cumulatively the following criteria:

a) Be one of the 200 highest negotiability index actions counted in the 12 months prior to the beginning of the revaluation process;
b) Have been traded in at least 50% of the trading sessions that occurred during the 12 months prior to the beginning of the revaluation process;
c) Meet the sustainability criteria approved by the Governing Council of the ISE.

Companies that are under judicial reorganization, bankruptcy process, special situation, or who have suffered or are under a trading halt of security over an extended period of time will not integrate the ISE.

2.4. *Company Sustainability and Co-Relative Concepts*

According to Schwartz and Carroll (2009), in the field of business and society, appear various constructs and concepts, there is a competition for prominence. Although debatable, researchers appear to include corporate social responsibility, business ethics, stakeholder management, sustainability and corporate citizenship. Despite the prevalence of the five constructs, difficulties in understanding what each really means, or can be said as each one can be related to each other.

Corporate sustainability, corporate social responsibility (CSR), business ethics, corporate citizenship, corporate social performance, Triple Bottom Line are some of the terms used to highlight the responsibility of the companies, in addition to the purely financial goals (Machado, Machado and Corrar, 2009).

A broad concept of corporate sustainability, according to Coral, Rossetto and Selig (2003) should consider three variables related to sustainable development that encompasses three basic principles: social equity, economic growth and environmental balance. According to the authors this way since the issue of economic growth is present on the competitiveness, it can be concluded that the sustainability of a company depends on its competitiveness, their relationship with the natural environment and their social responsibility.

Despite the references to corporate social responsibility already appear before the 50, was the work of Bowen's the highlight, where the author makes considerations about the role of entrepreneurs in society. In the Decade of 60, the literature on RSC increases significantly and the concepts being discussed on various aspects and philanthropy and governance were the main focuses. The CSR concepts became more specific from the 70 with the emergence of some concepts such as: the multiplicity of interests beyond the profit; the motivation for profit; the direct relationship between RSC and profit and the entrepreneur's interest not only in itself, but in the collective. The companies ' concern regarding poverty, exclusion, urban decay, etc. The profit as a source of CSR and the role of business as a contribution to society, among others. An important consideration is the idea of individual responsibility is replaced by a new perception that companies have responsibilities and must answer for their acts. Also during this time, the emphasis on alternatives such as social response has become banal.

Carroll (1999) further notes that in 1980, there is less original settings on CSR, but with more attempts to measure and conduct research on CSR, and thematic alternatives. In the Decade of 90, the CSR concept increases significantly with an evolution of alternative themes, such as the theory of *stakeholders*, *business ethics*, *international social issues*, *business and society/ social issues, corporate social performance, business and government/public policy*, *environmental issues*.

Starting from the analysis of the situation of companies in the European market, Swift and Zadek (2002) conclude that initiatives in the area of corporate social responsibility remain limited, when they are not embedded in broader policies and strategies. The authors delineate three stages of corporate social responsibility: the first is the basic stage. In it, the company considers corporate social responsibility as a mere obligation to comply with the laws in accordance with the current regulations. The first generation of corporate social responsibility, the company realizes the importance of avoiding risks and crises, or to both, implements risk-management processes of short term, proactive actions and charitable donations. This is a justification supported on the benefits that could improve the functioning of the company, and not on any ethical principle and self-interest. In the second generation, the company incorporates such liability in its structure, creating a kind of Department. In the third generation, corporate social responsibility is seen not as the behavior of some private companies but a development of a widespread participation among multiple stakeholders.

Kreitlon (2004) discusses the evolution of the main theoretical currents committed to justify the concept of corporate social responsibility. To the author, the School of Business practice (Business Ethics), as a branch of applied ethics, proposes a treatment of philosophical nature, values-centric normative and moral judgments, while the current market and what we could call the company (Business Society) adopts a sociopolitical perspective, and suggests a contractual approach to problems between companies and society. Finally, the school of management of social issues (Social Issues Management) is clearly utilitarian in nature, and the social problems as variables to be considered in the context of strategic management. The regulatory approach is based on the idea that the company and its activities and not only its executives are subject to ethical judgment. The company's social responsibility stems directly from their moral responsibility, that is, it needs to act in a socially responsible way because, being this the correct, it is your moral duty to do so.

The contractual approach is based basically on three main theoretical assumptions: business and society are part of the same system, and are in constant interaction. Both are linked together by a social contract and the company is subject to control by society. According to the author the contractual approach emphasizes that, while social institution, the company is created to perform certain functions by the company; its legitimacy depends on the correct fulfillment of these functions. The more powerful an organization, the greater is its network of interested parties, the greater the social impacts that can cause, and become the demands to behave in a responsible way.

The strategic approach seeks to provide tools, management practices that can improve the ethical and social performance of the company. The idea is that in the medium and long term, what is good for society is good for the company, namely implicit and correlated manner, that what is good for the company is to society.

An approach of sustainability associated with the global crisis is pointed to in Geels (2013), the threshold of the new Millennium awakens three world crises: the economic and financial crisis; environmental problems with growth in exploration of nature; and, the indebtedness of households moved to consumption. In this interpretation, the author reports that modern societies have entered an era in which financial problems, socio-economic and environmental converge to a “triple crisis”. These, in turn, has positive effects on sustainability transitions, which can then pave the way for fundamental solutions, such as a zero-growth economy.

2.5. *Social responsible investments and financial performance*

During the last decade, socially responsible investments, also known as ethical or sustainable investments, investments have grown rapidly around the world. For Renneboog, Horst and Zhang (2008), the socially responsible investment represents an investment process that integrates social, environmental and ethical aspects in making investment decision. Unlike conventional types of investments, by applying a set of investment screens to select or exclude assets with ecological basis, social or corporate governance ethical criteria, and often engages in local communities and in shareholder activism to new corporate strategies.

To Rezende, Nunes and Portela (2007, p. 6) “the biggest question in studies of socially responsible investment performance is whether these investments are performing better, worse or similar to other conventional investments, which do not use the criteria of social, environmental and corporate governance as a selection of the best papers”.

The authors note that studies carried out abroad in European countries and in the United States on financial performance of socially responsible investment, have several results, which mostly indicate evidence of similar performance, however still present weaknesses and inconsistencies.

ISSN: 2047-2528
Vol. 2 No. 12 [01-12]

Machado, Machado and Corrar (2009) analyzed the ISE performance against other portfolios of BM&FBOVESPA and claim that the findings cannot lead to the conclusion that socially responsible investments have equal investment return of those who do not adopt the same conduct, but that the average return of the indexes is similar. The same authors criticize the survey conducted by Rezende, Nunes and Portela (2007) used student's t-test and a sample considered small, but the results were similar.

The works done by Rezende, Nunes and Portela (2007) and Machado, Machado and Corrar (2009) motivated to look for similar methodology ISE wallets, IGC and IBOVESPA during a turbulent period in the markets, that is during a crisis.

Another approach to this work, the design of Murphy and Schlegelmilch (2013), they analyzed the mechanism by which institutional arrangements that shape the motivations for corporate social responsibility. Since, for them, such liability, forms, functions, and at different times. For them, this distinction allows you to consider the corporate governance system as the link between the institutions their respective motivations.

In this sense, they attest that governance assigns a perspective of corporate social responsibility in three levels of governance: the first is the role of social responsibility within and outside institutions, for example, the United Nations Global Compact, the international organization for Standardization (ISO 26000) and various OECD guidelines (Organization, economic cooperation and development) in the interests of the enterprises in developing their corporate social responsibility (CSR) policies; the second role is that multinational corporations should institutionalize its social responsibility within its organizational structure and transnational, the example of companies like Coca-Cola, Nestle, Unilever and Wal-Mart; the third role is understood to the authors as a more sophisticated element in transnational governance and social responsibility by creating in national institutions in the country of origin or not institutionalize their corporate social responsibility practices, for example, the fair trade movement can have political implications in the country and in countries where they have their branches.

But corporate governance addresses how companies fulfill their legal responsibilities, which represents the basis on which the social responsibility can be built.

3. METHODOLOGY

The present research is characterized as descriptive with a quantitative approach. The data were collected in February 2012 including the period January 2008 to December 2011, the period that includes the global financial-economic crisis. The database for the analysis are the average prices of the IBOVESPA index, IGC and ISE pulled directly on the website of BM&FBOVESPA in February 2012 and sorted in Microsoft Office Excel 2007 worksheet.

Whereas the variance analysis compares the average of the values within the period under examination, however, ignores the time of occurrence of each value, we decided to treat with Exponential Smoothing. The various Smoothing techniques deal with the time series to replace a given value X (t) of the series by an average (simple or weighted) of k values X of X (t). Has a lot less susceptible to noise, where you can check more easily trends or patterns.

Finally, to perform the comparison of income levels ran an ANOVA, applying a logarithmic transformation to the dataset in order to obtain homogeneous variances.

4. DATA ANALYSIS

Statistical analysis of collected data base of BM&FBOVESPA was performed comparing the average daily return of each portfolio grouped by year (4 years) from 2008 to 2011 of the IBOVESPA index, IGC and ISE and described in the table 1 where they were observed and calculated the average, median, minimum, maximum, variance and standard deviation.

Table 1:
General descriptive statistics of the data set

	Average	Medium	Minimum	Maximum	Variable	Pattern Deviation
Ibovespa 2008	55329.26	59731.01	35960.02	71075.03	146007097	12083.34
Ibovespa 2009	52748.27	52024.94	39438.15	68213.50	106161606	10303.48
Ibovespa 2010	67275.21	68147.79	62654.21	70579.10	7541476	2746.17
Ibovespa 2011	61347.65	61458.64	53736.77	69855.74	31886248	5646.79
IGC 2008	6993.60	6890.25	6383.77	7731.41	212832	461.34
IGC 2009	5092.70	5017.03	3712.34	6668.76	1102260	1049.89
IGC 2010	6993.60	6890.25	6383.77	7731.41	212832	461.34
IGC 2011	6894.83	6974.47	6149.19	7641.70	254078	504.06
ISE 2008	1732.20	1848.33	1204.61	2175.91	108065	328.73
ISE 2009	1490.35	1464.53	1123.11	1926.28	75513	274.80
ISE 2010	1957.05	1945.98	1839.49	2075.62	5605	74.87
ISE 2011	2020.83	2035.25	1821.75	2165.15	11526	107.36

The Spearman correlation allows us to have an idea of how the behaved during the same time period and it varies between 1 and -1. Where -1 is the maximum negative correlation, 1 the maximum positive correlation and 0 absence of correlation. Positive correlation occurs if all indexes followed the same trend (this is increased or decreased, i.e. also responded to the market or the economy, part of a larger scenario of influences), negative correlation occurs if an index has increased while the other declined. This analysis was performed as can be observed in the 2 to 5. The values with asterisk indicate significant correlations, it is, p<0.05.

Table 2:
Spearman correlations for 3 indices during the year of 2008

	Ibovespa 2008	IGC 2008	ISE 2008
Ibovespa 2008	1.000000	-0.916084*	0.979021*
IGC 2008	-0.916084*	1.000000	-0.916084*
ISE 2008	0.979021*	-0.916084*	1.000000

According to table 2, the IBOVESPA and the IGC in 2008 had strong negative correlation, which is a curious factor while an increased the other decreased during the year.

Table 3:
Spearman correlations for 3 indices during 2009

	Ibovespa 2009	IGC 2009	ISE 2009
Ibovespa 2009	1.000000	0.986014*	0.972028*
IGC 2009	0.986014*	1.000000	0.993007*
ISE 2009	0.972028*	0.993007*	1.000000

Noting the 3 Table, the indexes had strong positive correlation indicating that in the year 2009 the same responded in sync to a larger setting.

Table 4:
Spearman correlations for 3 indices during the year 2010

	Ibovespa 2010	IGC 2010	ISE 2010
Ibovespa 2010	1.000000	0.818182*	0.839161*
IGC 2010	0.818182*	1.000000	0.972028*
ISE 2010	0.839161*	0.972028*	1.000000

In the same way that occurred in the previous year, in 2010 the indexes also had strong positive correlation as can be seen in table 4.

Table 5:
Spearman correlations for 3 indices during the year 2011

	Ibovespa 2011	IGC 2011	ISE 2011
Ibovespa 2011	1.000000	0.993007*	0.986014*
IGC 2011	0.993007*	1.000000	0.979021
ISE 2011	0.986014*	0.979021*	1.000000*

In table 5 we observe the same trend occurred in the two previous years of 2009 and 2010 where the indexes behaved similarly with strong positive correlation and similarly indicating that responded in sync to a larger setting.

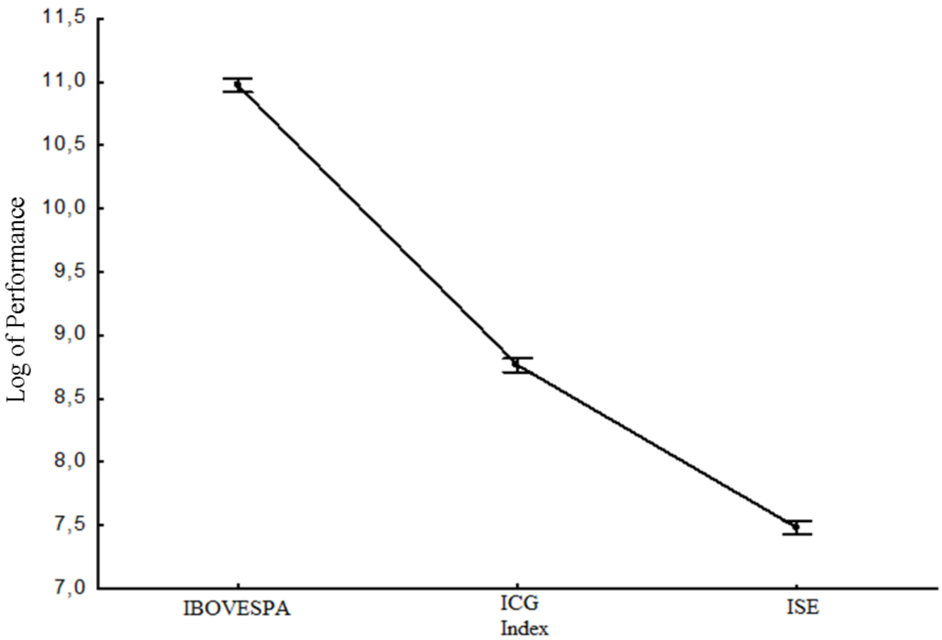

Figure 1. Performance comparison of indexes after ANOVA

Finally, to perform the comparison of income levels ran an ANOVA, applying a logarithmic transformation to the dataset in order to obtain homogeneous variances.

The variances are homogeneous by Levene ($F=0.38$, $p=0.67$), and the results of ANOVA were: $F(2, 141) = 4247.6$, $p < 0.01$. In descending order the result was: IBOVESPA > IGC > ISE as can be seen from Graphic 1.

6. CONCLUSIONS

The overall objective of the present research was to conduct a comparative analysis between the average profitability of indices (IBOVESPA, IGC and ISE) from January 2008 to December 2011 period of great global turbulence.

The results show that even in times of crisis, the strong existing correlation indicates that when the IBOVESPA INDEX rises the other IGC and ISE indexes also rise, being both similar behavior in times of crisis.

This behavior has been observed not only in the year 2008 between the IBOVESPA and the IGC with a strong negative correlation, where a likely hypothesis is the investors ' search for safe roles in the beginning of the crisis. Over the period however this correlation does not remain.

A relevant observation is that unlike than imagined, the IBOVESPA was a result of better performance across all indexes, followed by the IGC and ISE respectively in analysis undertaken over a period of 4 years, in the case from 2008 to 2011.

In the same way as in the polls that paved the way this study and previous research carried out only with the IBOVESPA and the ISE the results even in times of crisis also behaved in a similar way, despite the variation of techniques of statistical analysis and data treatment of employees and the different periods of time.

As a suggestion for further research, analyze the other indexes of BM&FBOVESPA as it is of relevance to analysis of various sectors of the Brazilian economy included in these indexes. Especially from the fiscal and economic measures taken by other countries in the world during the crisis, it is recommended that analysis or comparative performance of indexes of stock exchanges of other countries from that perspective.

REFERENCES

BM&FBOVESPA – Bolsa de Valores, Mercadorias e Futuros. (2012). Available in: <http://www.bmfbovespa.com.br>. [Accessed February 08, 2013]

Borba, P. da R. F. (2006). Relação entre desempenho social corporativo e desempenho financeiro de empresas no Brasil. In: XXX EnANPAD - Encontro da Associação Nacional de Pós-Graduação e Pesquisa em Administração, *Proceedings...*, Salvador/BA, Brazil.

Carroll, A. B. (1999). Corporate social responsibility: evolution of a definitional construct. *Business & Society*, 38(3): 268-295.

Cavalcante, F., Misumi, J. Y., Rudge, L. F. (2009). *Mercado de capitais: o que é, como funciona*. (7th ed.). Rio de Janeiro: Campus.

Cintra, M. A. M., Farhi, M. (2008). A crise financeira e o global shadow banking system. *Novos estudos - CEBRAP* [online], 82: 35-55.

Coral, E., Rossetto, C. R., Selig, P. M. (2003). Planejamento estratégico para a sustentabilidade empresarial: uma proposta para convergência das estratégias econômicas, ambientais e sociais. In: XXVII EnANPAD - Encontro da Associação Nacional de Pós-Graduação e Pesquisa em Administração, *Proceedings...*, Rio de Janeiro/RJ, Brazil.

Ferreira, V. H., Silva, A. P. A. da. (2011). Teoria do caos aplicada à definição do conjunto de entradas de modelos neurais autônomos para previsão de carga em curto prazo. *SBA Controle & Automação* [online], 22(6): 585-597.

Forrester, V. (2010). Reseña de el horror econômico. *Estudios Fronterizos*, 1(1): 225-231.

Geels, F. W. (2013). The impact of the financial–economic crisis on sustainability transitions: financial investment, governance and public discourse. *Environmental Innovation and Societal Transitions*, 6: 67-95.

Holland, M., Brito, I. A. (2010). A crise de 2008 e a economia da depressão. *Revista de Economia Política*, 30(1): 180-182.

IBGE – Instituto Brasileiro de Geografia e Estatística. (2008). Estatística de empreendedorismo. Available in: <http://www.ibge.gov.br/home/estatistica/economia/empreendedorismo/empreendedorismo.pdf>. [Accessed February 01, 2013]

Iley, R. A., Lewis, M. K. (2011). Has the global financial crisis produced a new world order? *Accounting Forum* [online], 35(2): 90-103.

Kreitlon, M. P. (2004). A ética nas relações entre empresas e sociedade: fundamentos teóricos da responsabilidade social empresarial. In: XXVIII EnANPAD - Encontro da Associação Nacional de Pós-Graduação e Pesquisa em Administração, *Proceedings*...,. Curitiba/PA, Brazil.

Lordon, F. (2007). O mundo refém das finanças. *Le Monde Diplomatique*, Lisboa, October. 19, 2007. Available in: <http://pt.mondediplo.com/spip.php?article107>. [Accessed December 20, 2011]

Machado, M. R., Machado, M. A. V., Corrar, L. J. (2009). Desempenho do índice de sustentabilidade empresarial (ISE) da bolsa de valores de São Paulo. *Revista Universo Contábil*, 5(2): 24-38.

Mendes, T. (2009). Crise global: cuidado para o barco não afundar. *Revista Brasileira de Administração*, 68: 24-32.

Mendonça, A. R. R. de *et al.* (2008). *Dossiê da Crise*. Available in: <http://www.ppge.ufrgs.br/akb/dossie-crise.pdf>. [Accessed March 10, 2010]

Moshirian, F. (2011). The global financial crisis and the evolution of markets, institutions and regulation. *Journal of Banking & Finance*, 35(3): 502-511.

Miura, M. N., Souza, M. J. B. de, Marcon, R. (2011). A crise global e seus impactos no desempenho do índice de sustentabilidade empresarial ISE e do Índice BOVESPA IBOVESPA. In: XXXI ENEGEP - Encontro Nacional de Engenharia de Produção, *Proceedings...*, Belo Horizonte/MG, Brazil.

Murphy, P., Schlegelmilch, B. B. (2013). Corporate social responsibility and corporate social irresponsibility: Introduction to a special topic. *Journal of Business Research*, 1: 1-7. DOI: http://dx.doi.org/10.1016/j.jbusres.2013.02.001

Renneboog, L., Horst, J. T., Zhang, C. (2008). Socially responsible investments: institutional aspects, performance, and investor behavior. *Journal of Banking & Finance*, 32(9): 1723-1742.

Rezende, I. A. C., Nunes, J. G., Portela, S. S. (2008). Um estudo sobre o desempenho financeiro do índice BOVESPA de sustentabilidade empresarial. *Revista de Educação e Pesquisa em Contabilidade*, 2(1): 71-93.

Shahrokhi, M. (2011). The global financial crises of 2007–2010 and the future of capitalism. *Global Finance Journal*, 22(3): 193-210.

Schwartz, M. S., Carroll, A. B. (2009). Integrating and unifying competing and complementary frameworks: the search for a common core in the business and society field. *Business & Society*, 47(2): 148-186.

Swift, T., Zadek, S. (2002). *Corporate responsibility and the competitive advantage of nations*. London: The Copenhagen Centre/Accountability.